Please provide the following information, and submit to the NOAA DM Plan Repository.

Reference to Master DM Plan (if applicable)

As stated in Section IV, Requirement 1.3, DM Plans may be hierarchical. If this DM Plan inherits provisions from a higher-level DM Plan already submitted to the Repository, then this more-specific Plan only needs to provide information that differs from what was provided in the Master DM Plan.

URL of higher-level DM Plan (if any) as submitted to DM Plan Repository:

1. General Description of Data to be Managed

1.1. Name of the Data, data collection Project, or data-producing Program:

2011 NOAA Bathymetric Lidar: U.S. Virgin Islands - St. Thomas, St. John, St. Croix (Salt River Bay, Buck Island)

1.2. Summary description of the data:

This data represents a LiDAR (Light Detection & Ranging) gridded bathymetric surface and a gridded relative seafloor reflectivity surface (incorporated into the las format as intensity) for an area of shallow seabed:

1. Surrounding St. Thomas and St. John (STT/STJ): 3m x 3m grid

2. Mouth of Salt River Bay (SARI) in St. Croix: 5m x 5m grid

3. Buck Island Reef National Monument (BUIS) in St. Croix: 3m x 3m grid

Fugro LADS, in collaboration with NOAA's National Ocean Service (NOS), National Centers for Coastal Ocean Science (NCCOS), Center for Coastal Monitoring and Assessment (CCMA), Biogeography Branch, the University of New Hampshire and the National Park Service, acquired bathymetry, relative seafloor reflectivity and hyperspectral imagery in St. Thomas and St. John on thirteen separate dates between 1/29/2011 to 2/28/2011 and in St. Croix (SARI and BUIS) on 2/21/2011 and 2/22/2011.

1. STT/STJ

Bathymetry and reflectivity data were acquired using a LADS (Laser Airborne Depth Sounder) Mark II Airborne System from altitudes between 1,200 and 2,200ft at ground speeds between 140 and 210 knots. The 900 Hertz Nd: YAG (neodymium-doped yttrium aluminum garnet) laser (1064 nm) acquired 3x3 meter spot spacing

and 200% seabed coverage. For STT/STJ, 168.1 square kilometers of LiDAR were collected between 0 m and 40 m in depth. Data was flown for charting. This data met IHO Order 1 standards.

2. SARI

Bathymetry and reflectivity data were acquired using a LADS (Laser Airborne Depth Sounder) Mark II Airborne System from altitudes between 1,200 and 2,200ft at ground

speeds between 140 and 175 knots. The 900 Hertz Nd: YAG (neodymium-doped yttrium aluminum garnet) laser (1064 nm) acquired 5x5 meter spot spacing

and 200% seabed coverage. For SARI, 1.62 square kilometers of LiDAR were collected between 0 m and 34 m in depth. This data was collected for research, not charting. It was collected using the same acquistion parameters as STT/STJ, but its uncertainties were not quantified. As such, it is not known if this data meets IHO Order 1 standards.

3. BUIS

Bathymetry and reflectivity data were acquired using a LADS (Laser Airborne Depth Sounder) Mark II Airborne System from altitudes between 1,200 and 2,200ft at ground speeds between 140 and 175 knots. The 900 Hertz Nd: YAG (neodymium-doped yttrium aluminum garnet) laser (1064 nm) acquired 3x3 meter spot spacing

and 200% seabed coverage. For BUIS, 35.9 square kilometers of LiDAR were collected between 0 m and 49 m in depth. This data was collected for research, not charting. It was collected using the same acquistion parameters as STT/STJ, but its uncertainties were not quantified. As such, it is not known if this data meets IHO Order 1 standards.

The data received from NCCOS were in GEOTIFF format for both the lidar and seafloor reflectivity. The NOAA Office for Coastal Management converted these two data sets to text format and then combined them into one text file based on x and y. The text file was then converted to las format, where the seafloor reflectivity is represented as intensity. The data's horizontal coordinate system was NAD83 UTM 20 North, and depth values were collected in meters referenced to Mean Lower Low Water (MLLW) depths. Upon receipt of the data, the NOAA Office for Coastal Management converted the data to geographic coordinates and ellipsoid heights

for data storage and Digital Coast provisioning purposes.

Environmental factors such as wind strength and direction, cloud cover, water clarity and depth influenced the area of data acquisition on a daily basis. The data was processed using the LADS Mark II Ground System and data visualization, quality control and final products were created using CARIS HIPS and SIPS and CARIS BASE Editor. All users should individually evaluate the suitability of this data according to their own needs and standards.

Original contact information:

Contact Org:

National Centers for Coastal Ocean Science (NCCOS), Center for Coastal Monito...

1.3. Is this a one-time data collection, or an ongoing series of measurements?

One-time data collection

1.4. Actual or planned temporal coverage of the data:

2011-01-29 to 2011-02-28

1.5. Actual or planned geographic coverage of the data:
W: -65.07231, E: -64.554218, N: 18.420755, S: 17.763395

1.6. Type(s) of data:
(e.g., digital numeric data, imagery, photographs, video, audio, database, tabular data, etc.)
las

1.7. Data collection method(s):
(e.g., satellite, airplane, unmanned aerial system, radar, weather station, moored buoy, research vessel, autonomous underwater vehicle, animal tagging, manual surveys, enforcement activities, numerical model, etc.)

1.8. If data are from a NOAA Observing System of Record, indicate name of system:

1.8.1. If data are from another observing system, please specify:

2. Point of Contact for this Data Management Plan (author or maintainer)

2.1. Name:
NOAA Office for Coastal Management (NOAA/OCM)

2.2. Title:
Metadata Contact

2.3. Affiliation or facility:
NOAA Office for Coastal Management (NOAA/OCM)

2.4. E-mail address:
coastal.info@noaa.gov

2.5. Phone number:
(843) 740-1202

3. Responsible Party for Data Management
Program Managers, or their designee, shall be responsible for assuring the proper management of the data produced by their Program. Please indicate the responsible party below.

3.1. Name:

3.2. Title:
Data Steward

4. Resources
Programs must identify resources within their own budget for managing the data they produce.

4.1. Have resources for management of these data been identified?

4.2. Approximate percentage of the budget for these data devoted to data management (specify percentage or "unknown"):

5. Data Lineage and Quality

NOAA has issued Information Quality Guidelines for ensuring and maximizing the quality, objectivity, utility, and integrity of information which it disseminates.

5.1. Processing workflow of the data from collection or acquisition to making it publicly accessible

(describe or provide URL of description):

Process Steps:

- 2011-01-01 00:00:00 - 1. STT/STJ James Guilford and Scott Ramsay from Fugro LADS led this mapping effort. Hyperspectral data were acquired using a Hyspex VNIR-1600 sensor. Bathymetry and reflectivity data were acquired using a LADS (Laser Airborne Depth Sounder) Mark II Airborne System from altitudes between 1,200 and 2,200ft at ground speeds between 140 and 210 knots. The 900 Hertz Nd: YAG (neodymium-doped yttrium aluminum garnet) laser (1064 nm) acquired 3x3 meter spot spacing and 200% seabed coverage. Green laser pulses are scanned beneath the aircraft in a rectilinear pattern. The pulses are reflected from the land, sea surface, within the water column and from the seabed. The height of the aircraft is determined by the infrared laser return, which is supplemented by the inertial height from the Attitude and Heading Reference System and GPS height. Real-time positioning is obtained by an Ashtech GG24 GPS receiver combined with Wide Area DGPS (Differential Global Positioning System) provided by the Fugro Omnistar to provide a differentially corrected position. Ashtech Z12 GPS receivers are also provided as part of the Airborne System and Ground Systems to log KGPS (Kinetic Global Positioning System) data on the aircraft and at a locally established GPS (Global Positioning System) base station. 2. SARI James Guilford and Scott Ramsay from Fugro LADS lead this mapping effort. Hyperspectral data were acquired using a Hyspex VNIR-1600 sensor. Bathymetry and reflectivity data were acquired using a LADS (Laser Airborne Depth Sounder) Mark II Airborne System from altitudes between 1,200 and 2,200ft at ground speeds between 140 and 175 knots. The 900 Hertz Nd: YAG (neodymium-doped yttrium aluminum garnet) laser (1064 nm) acquired 5x5 meter spot spacing and 200% seabed coverage. Green laser pulses are scanned beneath the aircraft in a rectilinear pattern. The pulses are reflected from the land, sea surface, within the water column and from the seabed. The height of the aircraft is determined by the infrared laser return, which is supplemented by the inertial height from the Attitude and Heading Reference System and GPS height. Real-time positioning is obtained by an Ashtech GG24 GPS receiver combined with Wide Area DGPS (Differential Global Positioning System) provided by the Fugro Omnistar to provide a differentially corrected position. Ashtech Z12 GPS receivers are also provided as part of the Airborne System and Ground Systems to log KGPS (

Kinetic Global Positioning System) data on the aircraft and at a locally established GPS (Global Positioning System) base station. 3. BUIS James Guilford and Scott Ramsay from Fugro LADS lead this mapping effort. Hyperspectral data were acquired using a Hyspex VNIR-1600 sensor. Bathymetry and reflectivity data were acquired using a LADS (Laser Airborne Depth Sounder) Mark II Airborne System from altitudes between 1,200 and 2,200ft at ground speeds between 140 and 175 knots. The 900 Hertz Nd: YAG (neodymium-doped yttrium aluminum garnet) laser (1064 nm) acquired 3x3 meter spot spacing and 200% seabed coverage. Green laser pulses are scanned beneath the aircraft in a rectilinear pattern. The pulses are reflected from the land, sea surface, within the water column and from the seabed. The height of the aircraft is determined by the infrared laser return, which is supplemented by the inertial height from the Attitude and Heading Reference System and GPS height. Real-time positioning is obtained by an Ashtech GG24 GPS receiver combined with Wide Area DGPS (Differential Global Positioning System) provided by the Fugro Omnistar to provide a differentially corrected position. Ashtech Z12 GPS receivers are also provided as part of the Airborne System and Ground Systems to log KGPS (Kinetic Global Positioning System) data on the aircraft and at a locally established GPS (Global Positioning System) base station.
- 2011-01-01 00:00:00 - The reflectivity of an LADS pulse is a measure of the amount of energy reflected from the seabed for each individual laser pulse at the wavelength of the laser, 532nm (green/blue). The basic difference between processing an ALB waveform for depth and for reflectivity is that depth processing focuses on the leading edge of the return waveform, whereas reflectivity requires integration of the entire return pulse. Each sounding is assessed for suitability. Dry soundings and soundings in very shallow water are not processed for reflectivity. Each sounding is normalized for the electronic gain applied to the photo multiplier tube to which the received laser energy is optically routed. The gain-normalized return waveform is then analyzed to determine energy returning from the seabed. Integration of the waveform from the seabed will produce a numerical value of reflectivity. To ensure that this value accurately and meaningfully describes variation in seabed reflectivity several parameters must be taken into consideration. Energy is lost from the pulses transmitted from the aircraft. These losses include the air/water interface and those through the water column, and any system specific losses such as optical filtering and receiver field of view. Reflectivity value, calculated for each pulse, is the ratio between the received energy normalized for the losses described and the transmitted energy. Once a relative reflectivity value has been calculated, further statistical cleaning to remove outliers is completed. Because the dataset is of relative reflectivity rather than an absolute value for each point, the entire dataset is scaled to ensure the full dynamic range is used over the dataset. This scaling is applied over an entire survey area to ensure dataset consistency (Collins et al. 2007). Collins et al. 2007 is available online here: http://www.fugrolads.com/datasheets/Hydro_Intl_LiDAR_Seabed_Classification.pdf
- 2013-04-01 00:00:00 - The NOAA Office for Coastal Management received the bathymetric and reflectivity gridded data in GEOTIFF format. The data were in UTM

Zone 20N, NAD83 coordinates and were vertically referenced to MLLW. The vertical units of the data were meters. OCM performed the following processing for data storage and Digital Coast provisioning purposes: 1. The bathymetric and reflectivity data were converted from GEOTIFF format to text format. 2. A perl script, brundle.pl was created to combine the bathymetric and reflectivity text data sets into one text file based on x and y. The new text file format was x, y, z, r. 3. The new xyzr text file was processed through VDatum to convert from UTM coordinates to geographic coordinates and to convert from MLLW depths to ellipsoid heights using Geoid12A. 4. Data were converted from txt to las format and the points given a NOAA OCM bathymetric classification of 11 using the lastools tool, txt2las. The reflectivity data were incorporated into the las format and are represented as intensity. 5. Data were filtered for outliers using the lastools tool, las2las 6. Data were zipped to laz format

5.1.1. If data at different stages of the workflow, or products derived from these data, are subject to a separate data management plan, provide reference to other plan:

5.2. Quality control procedures employed (describe or provide URL of description):

6. Data Documentation

The EDMC Data Documentation Procedural Directive requires that NOAA data be well documented, specifies the use of ISO 19115 and related standards for documentation of new data, and provides links to resources and tools for metadata creation and validation.

6.1. Does metadata comply with EDMC Data Documentation directive?

No

6.1.1. If metadata are non-existent or non-compliant, please explain:

Missing/invalid information:
- 1.7. Data collection method(s)
- 3.1. Responsible Party for Data Management
- 4.1. Have resources for management of these data been identified?
- 4.2. Approximate percentage of the budget for these data devoted to data management
- 5.2. Quality control procedures employed
- 7.1. Do these data comply with the Data Access directive?
- 7.1.1. If data are not available or has limitations, has a Waiver been filed?
- 7.1.2. If there are limitations to data access, describe how data are protected
- 7.4. Approximate delay between data collection and dissemination
- 8.1. Actual or planned long-term data archive location
- 8.3. Approximate delay between data collection and submission to an archive facility
- 8.4. How will the data be protected from accidental or malicious modification or

deletion prior to receipt by the archive?

6.2. Name of organization or facility providing metadata hosting:
NMFS Office of Science and Technology

6.2.1. If service is needed for metadata hosting, please indicate:

6.3. URL of metadata folder or data catalog, if known:
https://www.fisheries.noaa.gov/inport/item/48218

6.4. Process for producing and maintaining metadata
(describe or provide URL of description):
Metadata produced and maintained in accordance with the NOAA Data Documentation Procedural Directive: https://nosc.noaa.gov/EDMC/DAARWG/docs/EDMC_PD-Data_Documentation_v1.pdf

7. Data Access
NAO 212-15 states that access to environmental data may only be restricted when distribution is explicitly limited by law, regulation, policy (such as those applicable to personally identifiable information or protected critical infrastructure information or proprietary trade information) or by security requirements. The EDMC Data Access Procedural Directive contains specific guidance, recommends the use of open-standard, interoperable, non-proprietary web services, provides information about resources and tools to enable data access, and includes a Waiver to be submitted to justify any approach other than full, unrestricted public access.

7.1. Do these data comply with the Data Access directive?

7.1.1. If the data are not to be made available to the public at all, or with limitations, has a Waiver (Appendix A of Data Access directive) been filed?

7.1.2. If there are limitations to public data access, describe how data are protected from unauthorized access or disclosure:

7.2. Name of organization of facility providing data access:
NOAA Office for Coastal Management (NOAA/OCM)

7.2.1. If data hosting service is needed, please indicate:

7.2.2. URL of data access service, if known:
https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=1394
https://coast.noaa.gov/htdata/lidar1_z/geoid18/data/1394

7.3. Data access methods or services offered:
This data can be obtained on-line at the following URL:

https://coast.noaa.gov/dataviewer/#/lidar/search/where:ID=1394

This data set is dynamically generated based on user-specified parameters.

;

7.4. Approximate delay between data collection and dissemination:

7.4.1. If delay is longer than latency of automated processing, indicate under what authority data access is delayed:

8. Data Preservation and Protection

The NOAA Procedure for Scientific Records Appraisal and Archive Approval describes how to identify, appraise and decide what scientific records are to be preserved in a NOAA archive.

8.1. Actual or planned long-term data archive location:
(Specify NCEI-MD, NCEI-CO, NCEI-NC, NCEI-MS, World Data Center (WDC) facility, Other, To Be Determined, Unable to Archive, or No Archiving Intended)

8.1.1. If World Data Center or Other, specify:

8.1.2. If To Be Determined, Unable to Archive or No Archiving Intended, explain:

8.2. Data storage facility prior to being sent to an archive facility (if any):
Office for Coastal Management - Charleston, SC

8.3. Approximate delay between data collection and submission to an archive facility:

8.4. How will the data be protected from accidental or malicious modification or deletion prior to receipt by the archive?
Discuss data back-up, disaster recovery/contingency planning, and off-site data storage relevant to the data collection

9. Additional Line Office or Staff Office Questions

Line and Staff Offices may extend this template by inserting additional questions in this section.